United States Patent

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[54] **FABRIC TAKE-UP APPARATUS**
1 Claim, 2 Drawing Figs.

[52] **U.S. Cl.** **242/57;** 26/70; 200/61.09
[51] **Int. Cl.** **B65h 25/16,** B65h 15/32
[50] **Field of Search** ..... 242/57, 36—39; 26/70; 30/44; 200/61.09

[56] **References Cited**

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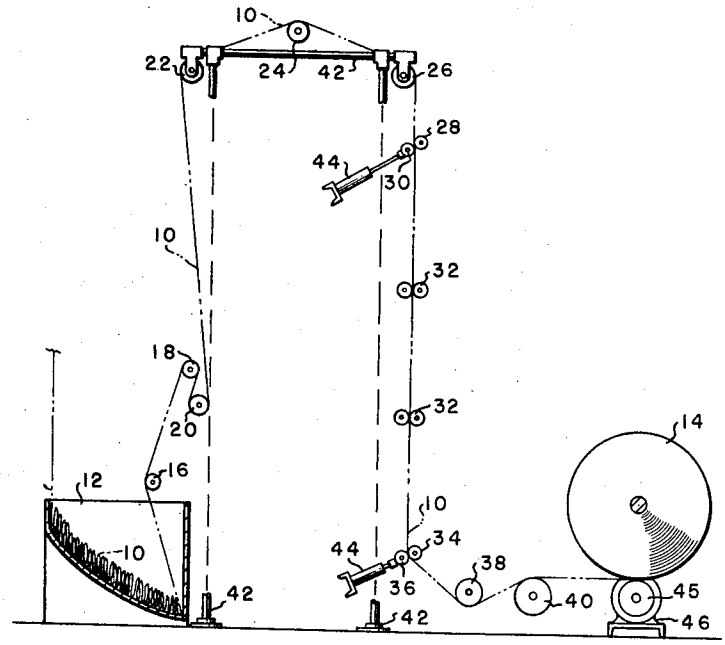
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ABSTRACT: This invention is directed to a detector which will detect the presence of metal objects in a moving web of material and automatically stop the takeup of such material so that the detected metal can be removed by the operator.



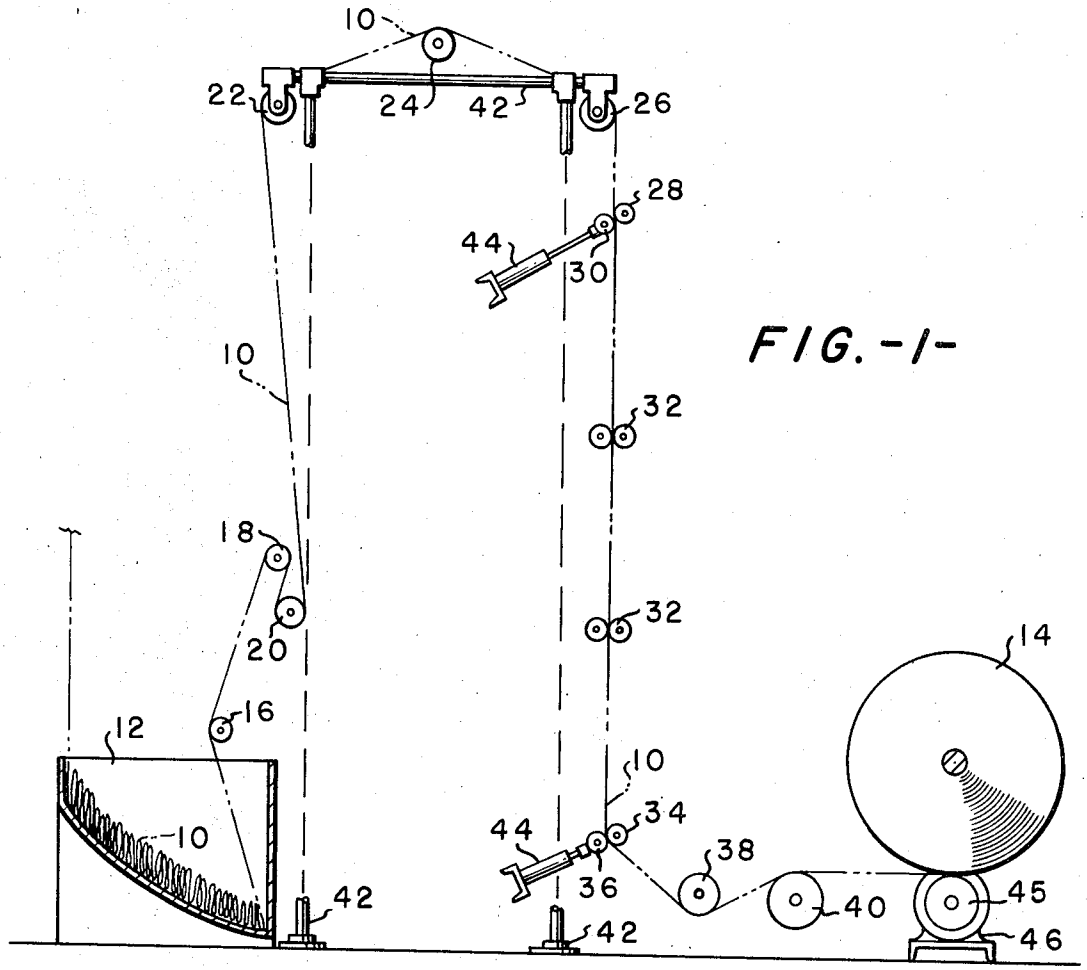


FIG. -1-

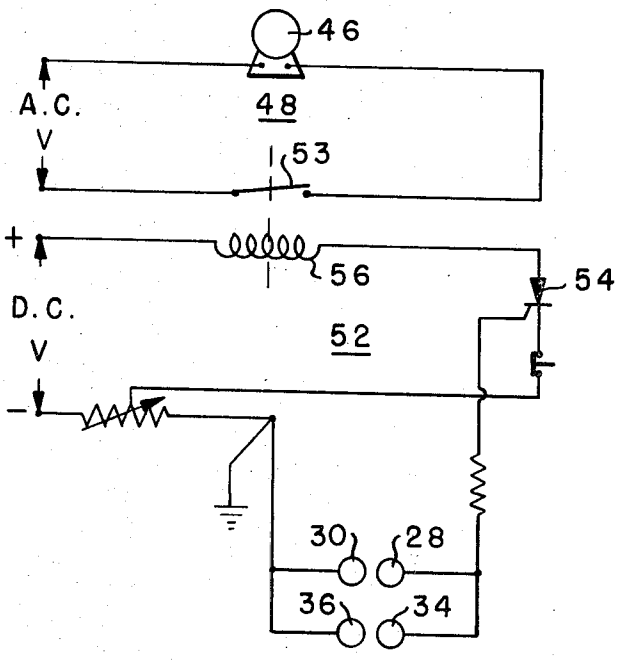


FIG. -2-

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FABRIC TAKE-UP APPARATUS

This application relates generally to a web handling machine and more particularly to a rolling or batcher machine for textile fabrics.

In the handling of textile fabrics relatively short lengths of fabric are woven and then are sewn together to form a long, continuous length for finishing. To perform this operation a rolling or batcher machine is used which in its simplest form has a sewing machine at one end to sew the shorter lengths of fabric together, a series of guide rolls to guide the sewn fabric and a takeup roll to roll up the long continuous length of fabric. In the processing of the shorter lengths of fabric prior to reaching the rolling machine it has been found that the fabric picks up small pieces of metal which, if allowed to remain in the cloth, will imbed themselves in the processing rolls at the finishing plant and tend to cut or tear fabric processed thereafter resulting in a considerable amount of yards of cloth which is classified as seconds or waste. To remove these particles of metal it seems most appropriate to detect and remove them at the rolling machine since this is the first place where the fabric is in long enough lengths to efficiently scan the fabric. The problem encountered is that it is necessary not only to detect small fragments of metal but to stop the takeup of the fabric before the fabric with the metal therein is wound onto the takeup roll.

It is therefore an object of this invention to provide a fabric handling apparatus which will readily detect small minute particles of metal in the fabric being handled.

Another object of the invention is to provide a fabric handling apparatus which will detect small minute particles of metal in the fabric and stop the takeup of the machine before the fabric containing metal is rolled onto the takeup roll.

Other objects and advantages of the specification will become clearly apparent as the specification proceeds to describe the invention with reference to the accompanying drawing, in which:

FIG. **1** is a schematic representation of the new and improved rolling machine; and

FIG. **2** is a schematic representation of a simplified control circuit.

Looking now to the drawing and especially to FIG. **1**, the overall operation will be explained. Fabric **10**, which has been formed into a continuous length by sewing piece lengths together, is delivered to the scray **12** of the rolling machine. From the scray **12** the fabric **10** is delivered to the takeup roll **14** bypassing the fabric over idler rolls **16** and **18**, under idler roll **20**, over idler rolls **22**, **24** and **26**, through detector rolls **28**, **30**, through two pair of fabric edge guide rolls **32**, through a second set of detector rolls **34**, **36** under guide roll **38** and over tension roll **40** to the takeup roll **14**. The above-mentioned rolls are mounted on a suitable frame **42**.

The detector rolls **30** and **36** are grounded and are held in position by pneumatic snubbers **44** to resiliently secure the rolls in position. The detector rolls **28** and **34** are electrically insulated rolls for reasons hereinafter explained. It should be noted that in the preferred form of the invention two sets of detector rolls are employed but obviously one set of rolls can be employed to perform the same operation. In the preferred form of the invention two sets of rolls are used as a safety measure in case one set of rolls should malfunction.

The takeup roll **14** is driven by a surface drive roller **45** which is in turn driven by a suitable motor **46**. Preferably motor **46** has a built-in dynamic brake to provide instantaneous breaking of the takeup roll to prevent rolling of fabric with metal therein onto the roll **14** after the metal has been detected.

In normal operation the control circuit **48** for the motor **50** will be energized since the switch **53** will be closed and the circuit **52** will be nonconducting since the silicon controlled rectifier **54** will be in nonconducting condition. When a piece of metal passes between either of the pair of rolls **28** and **30** or **34** and **36** a circuit is completed between the set of rolls through which it is passed and the silicon controlled rectifier will be turned on to energize the coil **56**. In turn the coil **56** will open the solenoid controlled switch **53** to open the circuit to the motor **46** and the dynamic brake associated therewith will stop the rotation of the takeup roll **14** so that the operator can remove the detected piece of metal. After the metal has been removed, push button switch **58** has to be pushed to open the circuit **52** since the silicon controlled rectifier **54** remains conducting until the circuit thereto is broken. The coil **56** then will be deenergized thereby closing switch **53** to restart the motor **46**. If desired, a light can be wired into the circuit **52** to provide a visual signal to the operator.

It is seen that the above-described apparatus and method provides a system in which pieces of metal in a moving web of fabric will be automatically detected and the operation be automatically halted until such detected metal is removed by an operator. Furthermore, the operation cannot be restarted until the operator physically performs the starting operation, thereby preventing accidental restarting of the operation before the operator has a chance to remove the detected metal.

Although I have described in detail the preferred embodiment of my invention, I contemplate that many changes may be made without departing from the scope or spirit of the invention, and I desire to be limited only by the claims.

I claim:

1. An apparatus to take up a continuous length of fabric comprising: a fabric takeup means, a fabric supply means, means to guide a length of fabric from said supply means to said takeup means, means to drive said takeup means, a pair of pairs of rolls spaced from one another in contact with the fabric held between the nips of each pair of rolls and control means to control the operation of said drive means, said control means having a first circuit normally conducting electricity when said apparatus in operation, means supplying alternating current to said first circuit, said first circuit including said drive means, said control means having a second circuit normally nonconductive when said apparatus is in operation, means supplying direct current to said second circuit, said second circuit including said pairs of rolls and a silicon controlled rectifier means to energize said second circuit when either of said pairs of rolls becomes conductive upon encountering a metal particle to deenergize said first circuit to deenergize said drive means.